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AUTHOR Downing, John A.
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ABSTRACT

Four paradoxes appear in research on learning to read: (1) the ability to name letters is a good predictor of reading readiness, yet letter-naming training does not help children learn how to read; (2) visual discrimination is often better in poor readers than in good readers; (3) learning to read two languages is easier than learning to read one; and (4) it is easier to learn to read in two alphabets than it is in one. These findings which contradict common sense may be easily explained by examining the thought processes at work during the reading process. Too often reading research looks at external aspects of reading such as eye movement, perception, and letter-naming and neglects the central processes of concept formation and reasoning. Examining the first paradox, for example, early experience with letter-naming often indicates an environment in which the parents read a lot and talk about reading, which gives support to the school's effort to teach reading. Learning letter-names for a child from a less stimulating environment, however, is often the rote learning of meaningless symbols. Hence letter-naming can indicate reading readiness but is not a useful method of teaching reading. The other three paradoxes can similarly be explained by looking at the cognitive processes involved. The implication then is that the learning and thought processes of the child must be the starting point for any teaching activity. References are included. (AL)

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JOHN DOWNING
Professor in Education
University of Victoria
B. C., Canada

Children's Thoughts and Language in Learning to Read

Paradoxes in Reading Research

Sometimes the results of research seem to crash head on into conflict with what seems obvious common sense to the practical classroom teacher. Then he or she feels inclined to reject the findings even though they have been obtained by reputable investigators adhering rigorously to the tenets of scientific research, and even when the same surprising or unexpected results have been confirmed by several independent scholars.

Such paradoxical research findings, however, should be a spur to our creative thinking. The resolution of the puzzling problems they create for us may lead to new perspectives on the ways children learn to read and how teachers can be more effective. This may be particularly helpful if several unrelated paradoxes suggest a common underlying explanation. This seems to be the case with the following four paradoxes in reading research.

1. Earlier letter-name knowledge is highly correlated with later reading achievement yet teaching letter-names does not help children learn to read.

Gavel (3) and many other researchers have found a high correlation between children's letter-name knowledge before starting first grade

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and their level of achievement in reading at the end of that first year of schooling. It has been found that letter-name knowledge is the best single predictor on a reading readiness test. These findings have led many to propose that, if teachers taught children the letter-names, it should improve their reading. Yet three independent experimenters (Ohnmacht--6, Johnson--4, Samuels--11) have each tried this out under rigorous scientific control and all reached the same conclusion -- that letter-name teaching gives the child no help whatsoever in learning to read.

Why this conflict in research? Why is it that teaching letter names is a waste of time and effort but letter-name knowledge is such a good guide to readiness?

2. Some reading disability cases are superior to normal readers in visual discrimination.

A second paradoxical research finding is one which seems to fly in the face of obvious common sense. In 1970, Serafica and Sigel (12) reported a careful scientific comparison they had made between normal and disabled boy readers. They found that: "The boys with reading disability in this study do not seem lacking in an analytic ability. If the initial phase of learning to read requires differentiation of graphic symbols from one another, the non-readers were better equipped for that task than were the boys who showed no reading problems." How can this be? Surely, reading is a visual skill. Why would poor readers be superior to normal readers in visual discrimination?

3. Learning to read two languages is easier than learning to read only one?

Modiano (5) found in Mexico that teaching Indian children to read their own Indian language first and then later Spanish led to superior achievements in reading Spanish than starting off with just the one language -- Spanish. Similarly, Österberg (7) in Sweden discovered that children taught to read in a local dialect first and then transferred to standard Swedish afterwards were superior in reading the latter in comparison with children from the same dialect area who were introduced to reading only standard Swedish from the beginning. This is another apparent insult to common sense. How can it be easier to learn to read two languages or two versions of the same language than it is to learn to read only one? Isn't there twice as much to learn?

4. It is easier to learn to read in two alphabets than it is in one.

The official curriculum committee for England and Wales, "The Schools Council", commissioned Warburton and Southgate (15) to review all the 17 different British and American investigations of i.t.a. Many educators who pride themselves on down to earth plain common sense have stated their belief that the i.t.a. approach must be crazy. The student learns i.t.a. first, then he must "unlearn" it and learn all over again the traditional orthography (T.O.) of English. Surely this must be at least double the work of learning to read and write T.O. straight away at the beginning. Warburton and Southgate examined this belief, but all the research evidence lead them to conclude:

> "There is no evidence whatsoever for the belief that the best way to learn to read in traditional orthography is to learn to read in traditional orthography. It would appear rather that the best way to learn to read in traditional orthography is to learn to read in the initial teaching alphabet." (pp. 234-5)

The Missing Link

How can common sense be so often at fault? Because we have failed to take into our store of "facts" some important psychological element in the process of learning to read. This gap in our adult common sense formula is the child and in particular the special ways in which children think and talk about reading and language. We tend to recognize the obvious factors in learning to read; visual discrimination because one must use one's eyes to see the printed page; auditory discrimination because one must be able to hear the individual words and phonemes of the spoken language which printed words and letters represent. What we have too often overlooked is the child's thought processes which must puzzle out the systematic way in which written language is related to speech.

Elkonin (2), the Russian authority on reading, stated recently:

> "...the perception and discrimination of printed characters is only the external side of the process of reading, behind which lies hidden the more essential and basic behaviour, which the reader produces with the sounds of language. The speed of the movement of the eye does not define the speed of reading. Nor does the so-called 'span of apprehension' determine the speed of reading (i.e. the number of graphic symbols perceived simultaneously). Of considerably greater importance than the speed of eye-movements and the span of apprehension is the speed of the underlying more central processes concerned with the behaviour of creating the sound form of the word and connected with it, its comprehension."

Thus, reading research has been overconcerned with the external aspects of reading -- perception, eye movements, visual discrimination, letter-name knowledge, etc. -- at the expense of neglecting the "underlying more central processes", those conceptual and reasoning processes of the child, which Elkonin has concluded constitute the heart of the problem of learning to read. If we follow up this conclusion of reading research in Russia, all four of our paradoxes no longer seem so paradoxical.

The disabled readers in the research of Serafica and Sigel were better at visual discrimination than the normal readers because seeing that printed letters are different is less important than knowing when to ignore differences. The reader develops this knowledge through the thought process of categorizing. Then many differences between printed shapes are correctly ignored because they have no significance for the skill of reading. Several years ago Helen Robinson (10) cited a study by Solomon which also found that some children failed in reading because of undue concern with unimportant details which are quite irrelevant to the reading act. For example, one eleven year old boy in a remedial reading class which I visited could not read leg because his teacher wrote the word in italic handwriting. He was confused by the extra curl at the bottom of the l. He lacked the bold flexibility of the successful reader who tries to sort unknown symbols into a category which will make sense. Thus the thinking process of categorization can be of much greater importance in reading than the ability to see whether one letter looks different from another.

Another paradox which may be explained if we consider children's thought processes in learning to read is the conflicting evidence about the role of letter-name knowledge in reading. Piaget (8) has observed that "verbal forms evolve more slowly than actual understanding". The natural process is for the child first to develop understanding and to form a concept. Then, when he has formed the new category, he needs a name or label for it. Thus when he begins to grasp the concept of "letter" he will try to label it, although, as Reid's (9) research has shown, he may at first give it a wrong name. Similarly with individual letters, the first thing that happens is that the child forms a concept of, for example, G, then he has something to name and may learn that people call this shape (and some others) "jee". The essential point to note is that the concept develops first and the name for it comes later.

Gavel and many others found the high correlation between letter-name knowledge at the beginning of first grade and reading achievements at the end of first grade because of the connecting link in the child's thought processes. The child who knows many letter-names before beginning first grade does so because he has developed numerous corresponding concepts about language and the way we write it. He probably has parents who read a good deal and talk about what they read. This type of environment will also support the school's efforts in teaching first grade reading. In contrast, the child with no knowledge of letter-names does not have the concepts they represent, probably because of a less stimulating environment, and his failure in

first grade reading will not be surprising. Thus the letter-name knowledge is a symptom of the state of the child's conceptual growth and in particular of his development of concepts of language. This development of children's concepts and reasoning abilities related to language is a fundamental factor in learning to read.

Thus it becomes clear why Samuels and others have found it a total waste of time to teach children letter-names. All that the teacher is doing is teaching the symptoms instead of an understanding of the basic concepts. The child will be able to recite letter-names but he may be just as ignorant as ever of the concepts to which they relate. Another Russian psychologist, Vygotsky (14), in his research on young children's learning of concepts concluded:

> "Direct teaching of concepts is impossible and fruitless. A teacher who tries to do this usually accomplishes nothing but empty verbalism, a parrotlike repetition of words by the child, simulating a knowledge of the concepts but actually covering up a vacuum."

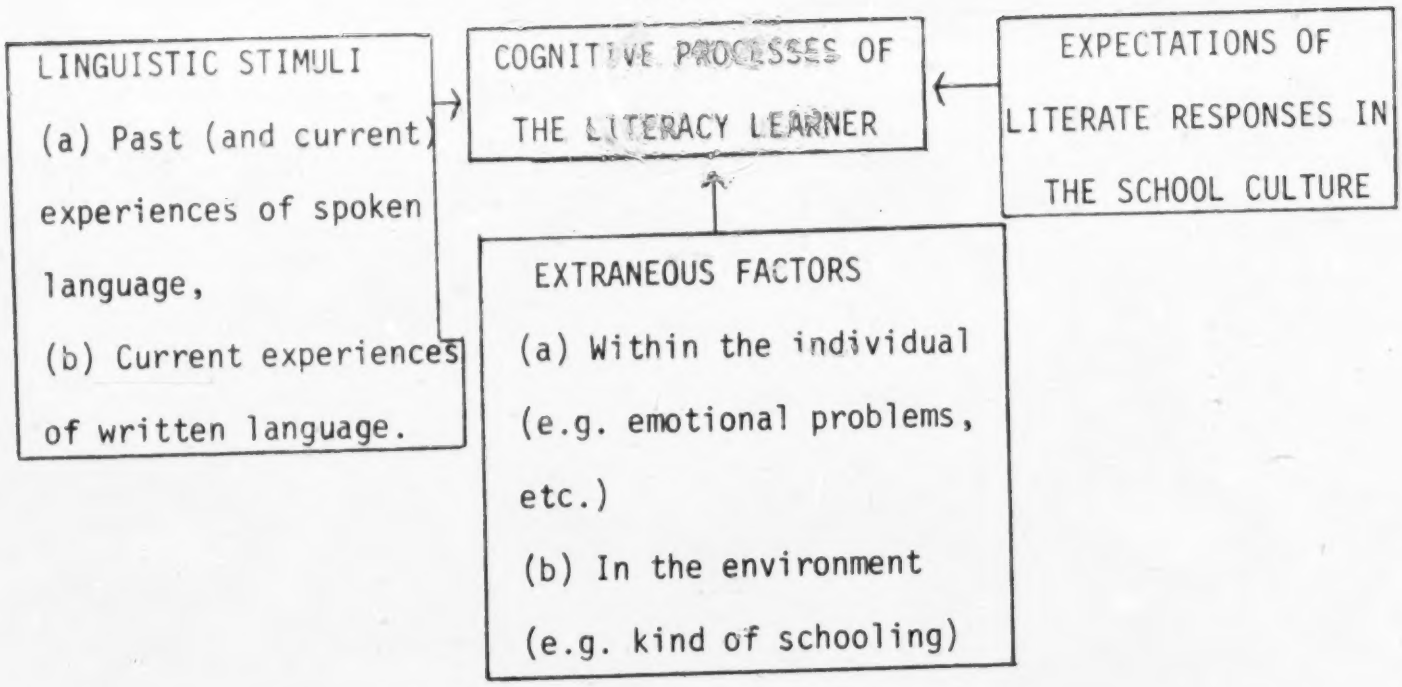
Rote learning of letter-names may have worse effects than are immediately apparent from Vygotsky's conclusion. Having a vacuum in one's understanding of what the teacher is talking about can cause feelings of puzzlement and a sense of inadequacy. It seems likely therefore that teaching letter-names before the child has the related concepts may be an additional cause of what Magdalen Vernon (13) calls "cognitive confusion", i.e. confusion in the child's understanding of the concepts and reasoning tasks used in reading. Vernon's monumental review of all research on causes of reading disability led her to the following position:

> "We may conclude that, rather than suffering from some general defect in visual or auditory perception, imagery or memory, the child with reading disability has broken down at some point, and has failed to learn one or more of the essential processes that we have described. He therefore remains fixed at a particular point and is unable to proceed further."

She states also: "Thus the fundamental and basic characteristic of reading disability appears to be cognitive confusion."

It follows, therefore, that teachers of reading should avoid any methods which may increase the child's cognitive confusion. Learning the name of something which does not exist in the child's mind surely must be confusing. On the other hand, cognitive clarity is much more likely to be enhanced if the name is learned when the child knows that he has a thought category that needs a label.

Our third paradox also may be resolved by a consideration of the child's basic need for cognitive clarity. An international team of researchers in educational psychology and related disciplines has just completed a survey of the problems of learning to read in 14 different countries. This Comparative Reading project has been organized by the writer of this paper (Downing -- 1). The systematic analysis of all the data from these different countries with widely varying environments and very different languages, including, Chinese, Japanese, Russian and Hebrew as well as the European languages with which people here are more familiar, seemed to be helped best by making the child's thought processes the focus of concern. Therefore, the following model was developed:


LINGUISTIC STIMULI
(a) Past (and current) experiences of spoken language,
(b) Current experiences of written language.
COGNITIVE PROCESSES OF THE LITERACY LEARNER
EXPECTATIONS OF LITERATE RESPONSES IN THE SCHOOL CULTURE
EXTRANEOUS FACTORS
(a) Within the individual (e.g. emotional problems, etc.)
(b) In the environment (e.g. kind of schooling)

In this model the cognitive processes of the student are bombarded with information and other influences from the three directions shown. The ideal situation for the child exists when the "linguistic stimuli" (on the left in the diagram) are in harmony with the "school expectations" (on the right), and also if there is a minimum of inference from "extraneous factors" (below). In those conditions sources of cognitive confusion will be at a minimal level and the child should develop steadily increasing cognitive clarity in regard to the concept formation and reasoning processes required in learning to read. This model explains why it was easier to learn to read in two languages than in only one in Modiano's Mexican research. The Indian students who were taught to read immediately in Spanish were subjected to an additional source of confusion. Their past experience of their own spoken language had almost no direct link with the written language they were required to interpret. Thus there was a mismatch between their past experience of linguistic stimuli and the expectations of

their teacher. In contrast, the Indian students who were taught to read their own Indian language first were able to develop basic concepts and to understand the logical relationships between speech and writing because there was a direct link between their past experience of linguistic stimuli and their teacher's expectations. Then when they moved on to reading in Spanish they were able to apply the basic concepts and reasoning abilities already learned in their own language to the second language. They could take with them into learning to read Spanish the cognitive clarity gained from having the closer match between spoken and written language in the initial phase of reading in the Indian language.

Österberg's results showed the same effect. It was easier to learn to read in two dialects of Swedish than one, because beginning in the local dialect presented to the children a clear relationship between the speech they knew and the written form to be acquired. The resulting cognitive clarity could be taken with them and applied to learning to read standard Swedish. But the children who immediately upon entering school were plunged into reading the unknown standard Swedish were beset by increased sources of cognitive confusion caused by the mismatch between what they knew about spoken language (i.e. their dialect) and what the teacher said about language (i.e. her dialect -- standard Swedish).

The apparent paradox of the i.t.a. research conclusions seems to have a similar general explanation. An important source of cognitive confusion in some languages, including English, is the mismatch between

the phonemic structure of the spoken form and its graphemic model in the written form. Dialects notwithstanding, when the teacher requires her students to associate phonemes with graphemes and to use reasoning processes to decode written English to one of the accepted forms of "Standard English", this task is much easier in i.t.a. because i.t.a. is a simpler and more regular code for that standard speech. The relationship between the printed symbols and the spoken sounds is clearer. Therefore, the i.t.a. student has a better chance of developing cognitive clarity, and, when he transfers to T.O., he can carry this cognitive clarity over to learning the more complex relationship in T.O. This transfer of cognitive development is so important that students who have begun with i.t.a. retain their advantage even in reading T.O., if teachers in the later grades adapt their teaching to the advanced progress of the i.t.a. students they receive.

Conclusion

The practical implication of this discussion is that the way the child thinks and learns should be the starting point for all our teaching work. Perhaps we could take a leaf out of the industrial psychologist's book. For a good many years now it has been recognized in industry that a dual approach is needed to maximize the worker's efficiency. Training is not enough. Not only must they fit the man for the job but they must also fit the job to the man. For example, the machinery, information displays, etc. must be designed to suit the men who work with them. A business man would be regarded as extremely foolish if he insisted that his employees must just learn how to use

awkward equipment when he could easily increase production by redesigning the equipment.

Similarly in teaching, quite apart from humanistic reasons, child-centred education is more efficient education. We need to be constantly redesigning our teaching equipment to fit the natural ways in which children think and learn. We need to think less about fitting the child to read and more about fitting the reading to the child. In this way our teaching will go with the stream of child thought, instead of, as so often happens, against it.

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